Making aid work for education in developing countries: an analysis of aid effectiveness for primary education coverage and quality

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Abstract: This paper examines the effect of education aid on primary enrolment and education quality. Using the most recent data on aid disbursements and econometric specifications inspired by the general aid effectiveness literature, we find some evidence that donors' increase in funding has substantially contributed to the successful increase in enrolment over the last 15 years. The most robust effect is obtained by aid for education facilities and training. In addition, we find complementarities between aid for primary and secondary education. Our qualitative comparative analysis of education quality also highlights the relevance of a balanced mix of educational expenditures.

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Corrigendum

Corrigendum to "Making aid work for education in developing countries: An analysis of aid effectiveness for primary education coverage and quality" [Int. J. Educ. Dev. 48 (2016) 37–52]

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The authors regret to inform that the following errors were overlooked in their article.

On page 39 of the article and in the variable description (Table A1, p. 49) we state that the main explanatory variable EDUCAID includes all aid disbursements for education, as reported to the Organization for Economic Co-operation and Development (OECD) Creditor reporting system (CRS), in constant 2010 US$, and is expressed in per capita of the recipient country's population. De facto, the econometric findings reported in the article reflect absolute aid disbursements for education − and not per capita. Since our main specification (Table 1, Regression 4) uses the log of EDUCAID, this does not change much of the results, even in terms of the coefficient estimates. Our earlier sentence *"As a rough approximation, the coefficient indicates that doubling annual education aid per capita for a period [of] five consecutive years implies a 5.6% increase in net enrolment rates." (p. 41)*, only needs to be adjusted upward to 6% rather than 5.6%. A doubling of annual education aid per capita leads to an increase in net enrolment by 6 percentage points. Hence the main argument of the article, i.e. that donors' increase in funding has substantially contributed to the successful increase in enrolment over the last 15 years, is still supported by the empirical evidence. In reasonable specifications, it holds not only for absolute aid, but also for aid per capita.

The re-calculation of all estimations using education aid per capita, as initially intended, reveals only two changes:

(1) In those regressions that we already considered less convincing methodologically in the initial paper (notably the GMM estimates in the appendix, and Regressions 1–2 in Table 1), education aid per capita is generally insignificant. The methodological concerns with these regressions were discussed on p. 40–41 in the original article.

(2) When looking at aid per capita to specific areas within education (Table 2), we find one more significant interaction term supporting our initial hypothesis of a complementarity between infrastructure and teacher training (see p. 44). Both variables are now individually significant and positive (at the median of the other variable), and the interaction effect is positively significant too (Table 2, Regression 14, and Fig. 3)

For further reference, all regression tables and related graphs using the corrected education aid per capita variable are presented below.

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Table 1
The effect of education aid on primary school enrolment (countries with initial NER < 80%).

VARIABLES	(1) System GMM NER (%)	(2) FE NER (%)	(3) FE NER growth (%)	(4) FE NER growth (%)
L.NER	0.46***	−0.01		
	(0.00)	(0.91)		
EDUCAID per capita	0.11	−0.10	−0.26	5.98*
	(0.35)	(0.69)	(0.60)	(0.07)
EDUCEXP	0.24	0.47*	0.50	7.72
	(0.61)	(0.07)	(0.55)	(0.42)
PTR	−0.12	−0.19	−0.18	−9.68
	(0.41)	(0.23)	(0.61)	(0.55)
YOUNG POP	−0.24	0.34	−2.04*	−53.25
	(0.20)	(0.49)	(0.07)	(0.16)
GDP per capita	−0.00	−0.00***	−0.00	−5.38
	(0.76)	(0.00)	(0.88)	(0.65)
BUDGET (surplus)	0.03	0.19	1.88***	1.51***
	(0.93)	(0.53)	(0.00)	(0.00)
INFLATION	−0.01	−0.02	−0.49**	−6.53**
	(0.46)	(0.80)	(0.03)	(0.03)
OPEN	0.02	0.07*	−0.11	−3.17
	(0.45)	(0.10)	(0.42)	(0.82)
FREE	−0.59	−3.64*	−11.27**	−10.45**
	(0.24)	(0.07)	(0.01)	(0.02)
Observations	260	260	260	257
Countries	110	110	110	110
R^2 (within)		0.47	0.30	0.32
Wald	Chi2 = 739.9 (0.00)			
Hansen	Chi2 = 9.03 (0.172)			
AR1	Z = −1.22 (0.223)			
AR2				

P-values in parentheses.
*** p < 0.01.
** p < 0.05.
* p < 0.1.

Table 2
The effect of education aid for different purposes on primary school enrolment.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Primary education	1.65**											0.31	0.73		2.88***
	(0.04)											(0.68)	(0.36)		(0.00)
Policy & Admin		2.13													
		(0.52)													
Facilities & training			2.41***									1.15	1.52*	3.36**	
			(0.00)									(0.15)	(0.06)	(0.01)	
Teacher training				1.53**								0.99	0.93	1.48**	
				(0.01)								(0.12)	(0.14)	(0.03)	
Educational research					0.38										
					(0.36)										
Basic skills						1.24**						0.73	0.95*		
						(0.03)						(0.24)	(0.10)		
Early childhood							−0.43								
							(0.51)								
Secondary education								0.86							1.96*
								(0.28)							(0.07)
Vocational training									−0.26						
									(0.79)						
Tertiary education										6.94**		3.69			
										(0.01)		(0.26)			
Advanced technical training											0.76				
											(0.32)				
Facilities and training x teacher training														0.18*	
														(0.10)	
Primary education x secondary education															0.28**
															(0.01)
EDUCEXP	7.16	7.24	7.20	8.41	6.88	7.15	5.93	7.66	6.49	8.50	8.29	9.46	8.71	8.18	7.42
	(0.46)	(0.45)	(0.46)	(0.38)	(0.49)	(0.45)	(0.56)	(0.42)	(0.51)	(0.38)	(0.40)	(0.32)	(0.36)	(0.40)	(0.43)
PTR	−9.64	−8.96	−4.59	−8.46	−10.64	−9.50	−9.16	−7.72	−9.77	−10.78	−8.22	−7.39	−6.04	−5.66	−12.75
	(0.56)	(0.59)	(0.79)	(0.62)	(0.51)	(0.56)	(0.59)	(0.64)	(0.56)	(0.51)	(0.62)	(0.66)	(0.72)	(0.74)	(0.45)
YOUNG POP	−54.66	−58.79	−56.61	−49.42	−62.93*	−45.23	−61.73*	−62.33*	−64.72*	−44.40	−64.82*	−28.97	−33.17	−46.87	−51.85
	(0.14)	(0.13)	(0.13)	(0.17)	(0.09)	(0.22)	(0.10)	(0.09)	(0.10)	(0.24)	(0.08)	(0.43)	(0.36)	(0.21)	(0.15)
GDP per capita	−4.37	−5.65	−4.93	−4.32	−7.62	−5.35	−6.25	−3.87	−5.74	−5.51	−4.96	−4.54	−4.18	−4.24	−6.88
	(0.71)	(0.64)	(0.68)	(0.71)	(0.50)	(0.64)	(0.61)	(0.74)	(0.64)	(0.64)	(0.68)	(0.70)	(0.71)	(0.71)	(0.56)
BUDGET (surplus)	1.43**	1.58***	1.90***	1.89***	1.72***	1.58***	1.66***	1.45**	1.65***	1.56***	1.55***	1.80***	1.80***	2.11***	1.43***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
INFLATION	−7.57**	−6.58**	−6.91**	−7.82***	−6.59**	−7.30***	−6.82**	−6.76**	−6.87**	−6.36**	−6.52**	−7.67**	−8.17***	−7.31**	−6.88**
	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)	(0.01)	(0.00)	(0.01)	(0.03)
OPEN	−2.47	−2.80	−2.10	−4.85	−3.07	0.77	−2.13	−1.22	−2.30	−3.61	−2.36	−2.63	−1.31	−2.17	−4.58
	(0.86)	(0.84)	(0.88)	(0.72)	(0.82)	(0.95)	(0.88)	(0.93)	(0.87)	(0.78)	(0.87)	(0.84)	(0.92)	(0.87)	(0.75)
FREE	−11.42***	−11.18**	−11.04**	−9.90**	−11.39**	−11.88***	−11.24**	−11.25**	−11.31**	−10.30**	−11.11**	−10.14**	−10.82**	−10.16**	−10.93**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Observations	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257
Number of Countries	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
R^2 (within)	0.32	0.31	0.34	0.33	0.31	0.32	0.31	0.31	0.31	0.33	0.31	0.36	0.36	0.35	0.34

Robust *p*-values in parentheses
*** p < 0.01.
** p < 0.05.
* p < 0.1.
The authors would like to apologise for any inconvenience caused.

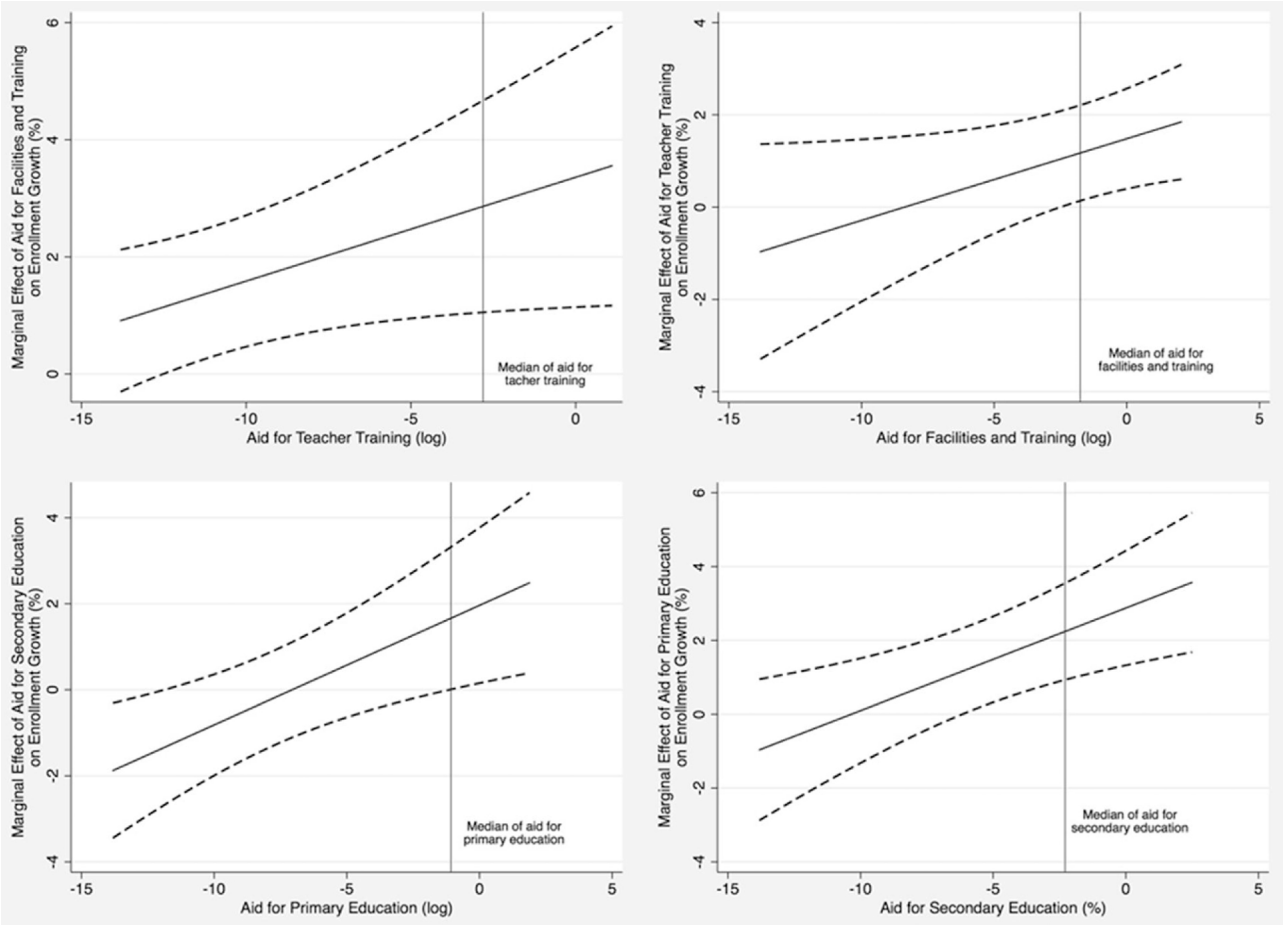

Fig. 3. Interaction effects (Table 2, Regressions 14 and 15).
Notes: Dashed lines show the 90% confidence interval. All aid variables are in logs.
Source: See Appendix, Table A1.

Appendix

Table A2 Replication of Michaelowa and Weber (2007, Table 1) with new disbursement data.

	(1)	(2)	(3)	(4)	(5)
Method	Arellano & Bond	Arellano & Bond, robust	Blundel & Bond, robust	Blundell & Bond, robust	Blundell & Bond, robust; additional IV: ENERGYAID
Variables considered endogenous	L.NER EDUCAID NER (%)	L.NER EDUCAID	L.NER EDUCAID	L.NER EDUCAID EXPEDUC	L.NER EDUCAID
Dependent variable	NER (%)	NER (%)	NER (%)	NER (%)	NER (%)
L.NER	−0.80	0.42	0.58***	0.47***	0.60***
	(0.22)	(0.27)	(0.01)	(0.00)	(0.00)
EDUCAID per capita	−0.40	−0.05	0.02	0.02	0.09
	(0.19)	(0.86)	(0.78)	(0.72)	(0.30)
EDUCEXP	2.71**	0.33	0.20	0.17	0.15
	(0.02)	(0.18)	(0.20)	(0.67)	(0.33)
PTR	0.38	−0.17	−0.13	−0.17	−0.13
	(0.25)	(0.44)	(0.36)	(0.18)	(0.27)
YOUNG POP	−5.09**	−0.74*	−0.08	−0.16	−0.07
	(0.01)	(0.08)	(0.64)	(0.33)	(0.68)
GDP per capita	−0.00**	−0.00	−0.00	−0.00	−0.00
	(0.02)	(0.24)	(0.92)	(0.78)	(0.83)
BUDGET (surplus)	0.70	0.26	0.16	0.15	0.29
	(0.14)	(0.52)	(0.49)	(0.55)	(0.24)

INFLATION	1.50**	−0.02	−0.02*	−0.02	−0.03**
	(0.04)	(0.84)	(0.06)	(0.18)	(0.03)
OPEN	−0.28*	−0.01	0.00	0.01	0.00
	(0.08)	(0.92)	(0.94)	(0.65)	(0.90)
FREE	−6.24**	−4.84**	−0.59	−0.73*	−0.49
	(0.01)	(0.05)	(0.20)	(0.10)	(0.34)
Observations	178	178	309	309	304
Number of Countries	105	105	131	131	129
Wald	Chi2 = 48292 (0.00)	Chi2 = 34934 (0.00)	Chi2 = 1434 (0.00)	Chi2 = 1186 (0.00)	Chi2 = 872 (0.00)
Hansen	Chi2 = 0.88 (0.347)	Chi2 = 6.79 (0.079)	Chi2 = 8.69 (0.069)	Chi2 = 9.38 (0.153)	Chi2 = 2.66 (0.264)
AR1	Z = −0.93 (0.353)	Z = −0.85 (0.395)	Z = −1.61 (0.107)	Z = −1.33 (0.185)	Z = −1.90 (0.057)
AR2	.	.	.	.	.
Instruments	19	21	23	25	19

P-values in parentheses.
*** p < 0.01.
** p < 0.05.
* p < 0.1.

Table A3 Replication of Michaelowa and Weber (2007, Table 1 new data), initial NER < 80%.

	(1)	(2)	(3)	(4)	(5)
Method	Arellano & Bond	Arellano & Bond, robust	Blundel & Bond, robust	Blundell & Bond, robust	Blundell & Bond, robust; additional IV: ENERGYAID
Variables considered endogenous	L.NER EDUCAID NER (%)	L.NER EDUCAID	L.NER EDUCAID	L.NER EDUCAID EXPEDUC	L.NER EDUCAID
Dependent variable	NER (%)	NER (%)	NER (%)	NER (%)	NER (%)
L.NER	−0.00	0.34	0.58**	0.46***	0.62***
	(1.00)	(0.21)	(0.01)	(0.00)	(0.00)
EDUCAID per capita	−0.46	−0.32	0.12	0.11	0.36*
	(0.27)	(0.30)	(0.36)	(0.35)	(0.08)
EDUCEXP	1.90*	0.40	0.23	0.24	0.16
	(0.06)	(0.10)	(0.21)	(0.61)	(0.38)
PTR	0.27	−0.11	−0.08	−0.12	−0.09
	(0.39)	(0.54)	(0.56)	(0.41)	(0.45)
YOUNG POP	−3.07**	−1.17***	−0.14	−0.24	−0.13
	(0.03)	(0.00)	(0.48)	(0.20)	(0.44)
GDP per capita	−0.00*	−0.00*	−0.00	−0.00	−0.00
	(0.08)	(0.09)	(0.82)	(0.76)	(0.72)
BUDGET (surplus)	0.85	0.32	0.09	0.03	0.26
	(0.17)	(0.36)	(0.75)	(0.93)	(0.31)
INFLATION	0.76	−0.05	−0.02	−0.01	−0.02*
	(0.17)	(0.62)	(0.20)	(0.46)	(0.07)
OPEN	−0.19	−0.01	0.01	0.02	0.00
	(0.22)	(0.85)	(0.80)	(0.45)	(0.95)
FREE	−8.53**	−6.49***	−0.48	−0.59	−0.21
	(0.02)	(0.01)	(0.35)	(0.24)	(0.71)
Observations	150	150	260	260	257
Number of Countries	88	88	110	110	108
Wald	Chi2 = 596869 (0.00)	Chi2 = 312545 (0.00)	Chi2 = 1279(0.00)	Chi2 = 739 (0.00)	Chi2 = 585 (0.00)
Hansen	Chi2 = 2.77 (0.096)	Chi2 = 6.47 (0.091)	Chi2 = 8.22 (0.084)	Chi2 = 9.03 (0.172)	Chi2 = 1.18 (0.554)

AR1	Z = −0.54 (0.586)	Z = −0.83 (0.404)	Z = −1.51 (0.132)	Z = −0.54 (0.586)	Z = −1.90 (0.057)
AR2	.	.	.	.	.
Instruments	19	21	23	25	19

P-values in parentheses
*** p < 0.01.
** p < 0.05.
* p < 0.1.

Table A4 The effect of education aid on primary school enrolment, all developing countries (as Table 1, but unrestricted set of countries).

	(1)	(2)	(3)	(4)
Variables	System GMM NER (%)	FE NER (%)	FE NER Growth (%)	FE NER Growth (%)
L.NER	0.47***	0.01		
	(0.00)	(0.89)		
EDUCAID per capita	0.02	−0.02	−0.09	4.94*
	(0.72)	(0.85)	(0.58)	(0.10)
EDUCEXP	0.17	0.46*	0.39	6.44
	(0.67)	(0.06)	(0.60)	(0.46)
PTR	−0.17	−0.17	−0.19	−9.05
	(0.18)	(0.31)	(0.56)	(0.52)
YOUNG POP	−0.16	0.30	−1.78*	−42.25
	(0.33)	(0.52)	(0.09)	(0.23)
GDP per capita	−0.00	−0.00***	−0.00	−3.59
	(0.78)	(0.01)	(0.93)	(0.72)
BUDGET (surplus)	0.15	0.25	1.74***	1.47***
	(0.55)	(0.36)	(0.00)	(0.00)
INFLATION	−0.02	0.01	−0.39**	−4.54
	(0.18)	(0.86)	(0.05)	(0.12)
OPEN	0.01	0.07*	−0.08	−1.31
	(0.65)	(0.06)	(0.50)	(0.91)
FREE	−0.73*	−2.49	−8.81**	−8.25**
	(0.10)	(0.13)	(0.02)	(0.03)
Observations	309	309	309	305
Countries	131	131	131	131
Wald	Chi2 = 1186 (0.00)			
Hansen	Chi2 = 9.38 (0.153)			
AR1	Z = −1.33 (0.185)			
AR2	.			
R2 (within)		0.42	0.28	0.30

P-values in parentheses.
*** p < 0.01.
** p < 0.05.
* p < 0.1.